

REMARKS

Claims 38-41, 43-45, 50-61, 63-70, and 72-82 are pending.

Applicants' Invention

In order to address the novelty and obviousness rejections set forth in the Office Action, Applicants believe it would be helpful to reiterate the claimed invention.

Multi-well filtration plates are commonly used to filter fluids. If the fluid is sufficiently viscous, the plates are often placed in a centrifuge in order to force the fluid through the filter material. However, the amount of fluid actually filtered in each of the wells is not always equal. Generally, the outer wells of the plate have more filtrate volume and the inner rows of the plate have the least amount of filtrate, thereby causing an uneven filtrate distribution or "smile effect," as shown in Figure 1 of the Application.

Applicants have made the surprising and non-obvious discovery that different forces affect the wells of a multi-well filtration plate when it is centrifuged in a swinging bucket rotor, and these forces give rise to the "smile effect." Applicants' invention identifies, characterizes, and offers multiple solutions to this problem to achieve uniform filtrate volumes in all wells. Prior to Applicants' invention, the problems associated with the "smile effect" had not even been recognized.

Applicants' invention relates to methods, systems, and devices for reducing the "smile effect" to provide an even distribution of filtrate in each well across the plate. In some embodiments, Applicants' invention provides an angling mechanism that can adjust the angle of the plate to a non-90° angle relative to a line wherein the line is perpendicular to the axis of rotation of the centrifuge and passes through the center of a major plane of the plate. The angle controls the force vector tangential to the membrane.

Applicants' invention provides the advantage that it can increase average volume filtered during centrifugation. The filtrate volume is substantially uniform with little well-to-well filtrate volume variability, thereby minimizing the "smile effect." The angling mechanism can increase the average filtrate flow rate among a plurality of wells in a filtration well plate.

Rejection of Claims 38, 39, 41, 43-45, 50, 53-59, 63-68, 73, 76, 78, 80, and 82 under 35 U.S.C. § 102(b)

Claims 38, 39, 41, 43-45, 50, 53-59, 63-68, 73, 76, 78, 80, and 82 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Stankowski, *et al.* (U.S. Patent No. 5,674,395).

The Examiner states that the reference discloses a multi-well filtration device that utilizes an ultrafiltration membrane (Col. 1, line 33) positioned at an angle with respect to the direction of gravitational force (Col. 1, line 22-23). The Examiner believes that this reference further discloses an embodiment wherein the membrane is flat and is located at the bottom of a chamber (see Fig. 8). The Examiner views the two converging walls 102 of the device shown in Fig. 8 as the "bottom" of chamber 100, since no other containing wall member is positioned below these converging walls.

Applicants respectfully disagree with the Examiner's assessment of Stankowski, *et al.* The Examiner is ignoring the plain teachings of the reference. Stankowski, *et al.* states the following:

The multi-reservoir construction of this invention is formed from reservoirs having an open top, a closed bottom, or no bottom, and a plurality of side walls wherein at least one side wall has at least one hole.

(See Col. 2, line 66 through Col. 3, line 3) Figure 8 is an embodiment showing the "no bottom" concept. While that device is not literally bottomless, the "bottom" is not the sidewalls, but the intersection of them as shown by centerline 108. The reference is clear that the filters are in the sidewalls, not the bottom, which is described as either being closed or non-existent. (See Col. 2, lines 25-30)

Applicants' claims include the limitation of "a flat membrane at the bottom of a storage chamber for processing a fluid." Stankowski, *et al.* merely disclose two converging side walls with each side wall having holes sealed by membranes. As shown in Figure 8, only the walls of the chamber extend to meet at the bottom. However, the membranes of Stankowski, *et al.* do not extend to the bottom of the storage chamber, as claimed by Applicants for processing the fluid. Applicants claim a device having a filter configuration that allows the chamber to filter to dryness. To the contrary, the device in Stankowski, *et al.* has a dead-stop region, formed by the converging walls, in which a portion of the fluid does not flow from the chamber.

Claim 78, and its dependent Claims 80 and 82, are directed to a fluid filtering device having a plurality of filtering wells within a plate, each well including a membrane for processing a fluid, the membranes being coplanar with the plate. Stankowski, *et al.* teach membranes positioned on a side wall of a reservoir, rather than at the bottom of the reservoir. (See Col. 2, lines 25-30) The teachings of Stankowski, *et al.* do not anticipate membranes that are coplanar with a plate and having an angling mechanism that sets the angle of the membranes within the plurality of filtering wells at a non 90° angle relative to a line perpendicular to an axis of rotation about which the plate rotates, the line passing through the center of a plane of the plate.

In light of these arguments, Applicants' claimed invention is not anticipated by Stankowski, *et al.*

Rejection of Claims 40, 51, 60, 61, 69, 70, 72, 74, 75, 77, 79 and 81 under 35 U.S.C. § 103(a)

Claims 40, 51, 60, 61, 69, 70, 72, 74, 75, 77, 79 and 81 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Stankowski *et al.*

The Examiner stated that the reference discloses the claimed invention with the exception of: (1) the recited wedge (Claims 40, 51 and 81); (2) the exact angle of the membranes (Claims 60, 69, 72, 75 and 79); and (3) the exact number of wells employed (Claims 61, 70, 74 and 77). The Examiner believes it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a "wedge" to adjust the angle of orientation of the reference membranes, since wedges are typically used to produce and maintain an object at an angle. The Examiner also believes it would have been obvious to one of ordinary skill in the art at the time the invention was made to angle the membranes of the reference system in the manner recited in claims 60, 69, 72, 75 and 79, since this reference clearly discloses a range which overlaps these values (See Col. 4, line 28). The Examiner stated it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the recited number of wells in the reference system in order to increase its treatment capacity.

As detailed above, Claims 38 and 41 recite that the membrane forms the bottom of the storage chamber. Claims 40, 51, 60, 61, 69, 70, 72, 74, 75, and 77 are dependent from Claims 38 or 41. Also, Claim 79 has a similar limitation. Stankowski, *et al.* do not teach or suggest a

membrane that forms the bottom of a storage chamber for processing a fluid. Additionally, Stankowski, *et al.* never appreciated that their devices could suffer from the smile effect, nor do they teach one how to overcome the issue. There is no motivation or suggestion to modify the filter devices taught in Stankowski, *et al.* in such a way.

Claim 78 was not rejected under 35 U.S.C. 103(a). Since Claim 81 is dependent from, and incorporates all the limitations of, Claim 78, Claim 81 cannot be obvious in view of the teachings of Stankowski, *et al.*

In light of these arguments Applicants' claimed invention is not made obvious by Stankowski, *et al.*

CONCLUSION

Claims 38-41, 43-45, 50-61, 63-70, and 72-82 are pending. In view of the above remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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